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# 613

L 38525-66

ACC NR: AF6029158

SOURCE CODE: GZ/0023/66/010/002/0184/0203

AUTHOR: Pecova, Jana; Praus, Oldrich; Tobyasova, Marta

ORG: Geophysical Institute, CSAV, Prague

TITLE: Study of the electrical conductivity of the Earth's mantle from magnetotelluric measurements of the Budkov (Czechoslovakia) Station

SOURCE: Studia geophysica et geodastica, v. 10, no. 2, 1966, 184-203

TOPIC TAGS: electric conductivity, upper mantle, electromagnetic wave phenomenon, electric impedance, resistivity

ABSTRACT: The article presents the results of analysis of data from the electromagnetic station at Budkov. The impedance curves were derived by the methods of spectral and harmonic analysis and by directly reading the amplitudes of the quasisinusoidal oscillations and were then used to find the magnetotelluric sounding curves for apparent resistivity. The resistance curves are interpreted and the results discussed. Apparatus for this work was lent by the Institute of Physics of the Earth, Moscow, and was installed at the Budkov Station by L. N. Baranski. The authors thank Professor A. N. Tikhonov, Corresponding Member AN SSSR, and N. V. Lipskaya for mediating the calculation of the analysis on the Strela automatic computer in the Moscow State University, as well as members of the Electromagnetic Station, Budkov and the Geomagnetic Station, Pruhonice, for handing on the material. The authors also thank their colleagues, M. Splichalova and A. Ustyanovicova for careful evaluation of the

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L 38525-66

ACC NR: AP6029158

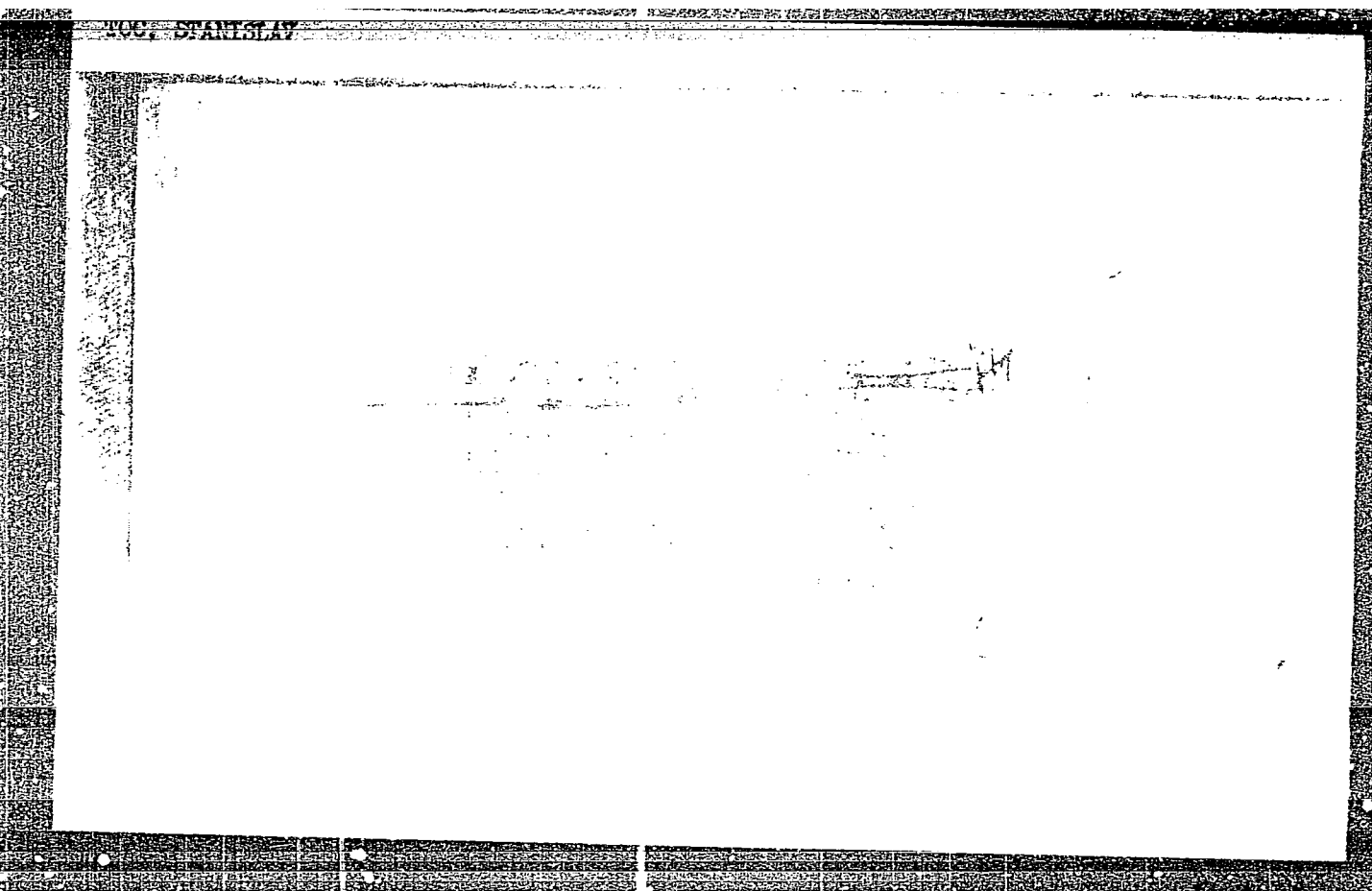
extensive material and carrying out the numerical and graphical work. Orig.  
art. has: 8 figures, 4 formulas and 3 tables. [Orig. art. in Eng.] [JPRS: 36,844]

SUB CODE: 08, 20 / SUBM DATE: 08Sep65 / ORIG REF: 006 / SOV REF: 004  
OTH REF: 005

Card 2/25m

"APPROVED FOR RELEASE: 07/16/2001

CIA-RDP86-00513R001756010001-0



APPROVED FOR RELEASE: 07/16/2001

CIA-RDP86-00513R001756010001-0"

TOCAIUC, Gheorghe, ing.

Technical operation characteristics of the motortrains with  
trailers and half-trailers. Rev transport 10 no.10:453-459  
0 '63.

PACOSTE, G., ing.; GEORGESCU, G., ing.; TOCAN, D., ing.; BANCUI, I., ing;  
OLANESCU, M., ing.

Studies on loss of circulation in well drilling and the methods  
of detecting the areas where losses occur. Petrol și gaze 14  
no.10:481-489 0'63.

13

23. "Let Us Build a Pulse-Net," Edgar Vesilio CIDBO TRA:  
pp 42-43.

PETREA, G., ing.; SBIREA, A., ing.; CONSTANTINESCU, D., ing.; ILIESCU, Gh., dr.  
TOCAN, M., biolog; ENESCU, C., ing.; DUHNEA, D., ing.; DEDU, V.,  
ing. COHN, A., ing.

Improving the physical and mechanical properties of paper by  
using Rumanian-made synthetic resins. Cel hirtie 11 no.2:  
62-69 F'62.

1. Institutul de Cercetari si Proiectari pentru Hirtie, Celu-  
loza si Stuf (for Tocan). 2. Fabrica de hirtie "1 Septembrie"  
(for Cohn).



CONSTANTINESCU, O., ing.; TOCAN, M., biolog.

Considerations on the refining of straw monosulfite cellulose  
by the beating process. Cel. hirtie. 10 no.2:54-58 F'61

EUROVA, I., ing., candidat in stiinta tehnice; TOCAN, M., biolog.

Considerations on the use of Rumanian fir wood to manufacture  
superior chemical celluloses. Pt.2. Cel hartie 11 no.3:91-99  
Mr.'62.

ILIESCU, Gh., dr.; SBIERA, A., ing.; TOCAN, M., biolog.; KONERTH, H., chim.

Study on the Rumanian hardwood as raw material for the  
pulp industry. Cel hirtie 10 no. 7/8:217-225 J1-Ag'61.

TOCAN, M., biolog; REICHMAN, S., ing.; STATION, C., ing.; L. JOHNSON, M.

Research on the fine structure of reed stem fibre walls by  
means of the electronic microscope (observations on ultrathin  
sections). Cellulose 14 no.1:1-7 Ja '65.

BUROVA, T., candidat in stiinte tehnice; TOCAN, M., biolog; GHELMETIU, N.,  
prof. dr.ing.; URSULESCU, A., ing.

Considerations on the use of Rumanian spruce wood for manu-  
facturing of high grade chemical pulps. Pt.1. Cel hirtie  
10 no.7/8:231-235 JI-Ag'61.

TOCAN, M., biolog

Contributions to the determination of the fibrous composition  
of paper by microscopic analysis. Cel hirtie 11 no.12:421-426  
D '62.

TOCAN, M., biolog; PETREA, G., ing.; ILIESCU, Gh., dr.

Studies on the spruce and fir wood grown outside the natural  
vegetation area used as raw material in paper manufacture.  
Pt. 1. Cel hirtie 12 no.7:214-222 J1 '63.

TOCAN, M.

Tests of cultivating the Italian reed Arundodonax in the Danube Delta and meadow lands for industrial purposes. Note II. p. 247.

CELULOZA SI HIRTIE. (Asociatia Stiintifica a Inginerilor si Technicienilor din Romania si Ministerul Industriei Petrolului si Chimie) Bucuresti, Romania. Vol. 8, no. 8, Aug. 1959.

Monthly List of East European Accessions (EEAI) LC, Vol. 9, no. 2, Feb. 1960.

Uncl.



TOCAN, M.

Tests of cultivating the Italian reed *Arundo-donax* in the Danube Delta and meadows for industrial purposes. Note I. page 6.

CELULOZA SI HIRTIE. (Asociatia Stintifica a Inginerilor si Tehnicienilor din Romania si Ministerul Industriei Petrolului si Chimie). Bucuresti, Rumania. Vol. 8, no. 1, Jan. 1959.

Monthly List of East European Accessions (EEAI) IC, Vol. 8, no. 7, July 1959.

Uncl.

TOCAUER, L.; DOUDA, M.

AGRICULTURE

PERIODICAL: ZEMEDELSKE STROJE. VOL. 2, no. 3, Mar. 1959

Tocauer, L. ; Douda, M. Equipment for steering and controlling agricultural machines. p. 251.

Monthly List of East European Accessions, (EEAI), LC, Vol. 8, no. 5,  
May 1959, Unclass.

TOCHACEK, Miloslav, inz. CSc.; FERJENCIK, Pavel, inz.

International Conference on Prestressed Steel Structures in Dresden.  
Poz stavby 12 no.5:220-221 '64.

TOCHACEK, Miloslav, inz. CSc.

"Prestressed metallic supporting structures" by J.I. Belenja  
[Belenya, E.I.]. Reviewed by Miloslav Tochacek. Poz stavby 12  
no.5:217 '64.

TOCHACEK, Miloslav, inz.

Calculation of the normal stress of a generally asymmetric section by the ideal section modulus method. Inz stavby 6 no.1:32-38 Ja '58.

TOCHACEK, Miloslav, ing., CSc.

Prestressed metal constructions of industrial buildings.

Poz stavby 11 no. 12: ~~642-646~~ '63.

1. Stavebni ustav, Ceske vysoke uceni technicke, Praha.

TOCHACEK, M.

Calculation of a simple eccentrically connected angle iron.

P. 98. (IZENYOSKE STAVEY) (Praha, Czechoslovakia) Vol. 6, No. 2, Feb. 1957

SO: Monthly Index of East European Accession (EEAI) IC Vol. 7, No. 5, May 1958

ROSENKRANZ, B., inz.; TOCHACEK, M., inz. CSc.

Tubular space binders prestressed by cables. Inz stavby  
12 no.11:495-500 N '64.

1. Skloprojekt, Prague (for Rosenkranz). 2. Institute  
of Building of the Czech Higher School of Technology,  
Prague (for Tochacek).



Method of analysis of cellulose formate (or other formic esters) by oxidation. O. Tocco and A. Nysens (Giorn. Chim. Ind. Appl., 1930, 12, 151-153). This method is applicable only to cellulose formates, since with the acetate the proportions of oxygen required for the complete oxidation of the cellulose and acetic acid are too nearly equal to allow of accurate results. The ester (1 g.), rendered anhydrous by heating at 100-105° for 2 hrs. or at a lower temperature in a vacuum, is treated with 125-150 c.c. of N-potassium dichromate and, slowly and with cooling, with 40 c.c. of sulphuric acid. If necessary, the evolution of carbon dioxide is restrained by cooling. After the lapse of 30 min. the beaker is left for 6 hrs. in a boiling water-bath; the excess of dichromate (which should be at least 10 c.c.) being determined by titration either with ferrous sulphate or iodometrically. The number of c.c. of N-dichromate required for 1 g. is 148.16, 150.78, 153.43, or 151.95 for cellulose and the mono-, di-, and tri-formates, respectively. This procedure, which may be used also for other formic esters, such as those of lysin by means of alkali. Of the finely powdered product, 1 g. is dissolved in 40% potassium thiocyanate solution and treated for 3 hrs. with excess (40 c.c.) of cold N-sodium hydroxide, the excess of which is then titrated (1 g. of the mono-, di-, or tri-formate requires 3.23, 9.18, or 12.19 c.c. of the alkali, respectively). If the ester is not finely powdered, the hydrolysis requires heat. For formic esters which are not readily attacked by normal sodium hydroxide, or are only slightly soluble in thiocyanates, or are of very abnormal composition, the oxidation method is recommended.

T. H. Pore.

GAFTEK, Ya.; KOZNEVSKAYA, G.; SMILETSKIY, B.; SERPINSKIY, S.; STAMPEN', L.;

TOCHEK, S.

Investigations on the pathophysiological mechanisms of speech disorders in focal affections of the dominant hemisphere of the brain. Zhur. nevr. i psikh. 55 no. 12:922-927 '55. (MLRA 9:2)

1. Otdel neyrokhirurgii Gosudarstvennogo psikhonevrologicheskogo instituta (dir.-prof. Z. Kuligovskiy) Varshava.

(SPEECH, DISORDERS, etiology and pathogenesis,  
brain lesions of dominant hemisphere)

(BRAIN, diseases,  
lesions of dominant hemisphere causing speech disorder)

L 2354-66

ACCESSION NR: AP5021794

UR/0340/65/000/008/0019/0019

AUTHOR: Tochelovich, N. (Engineer) / 114 53

TITLE: A stand for tractor carriages

SOURCE: Sel'skiy mekhanizator, no. 8, 1965, 19

TOPIC TAGS: tractor, towing vehicle

ABSTRACT: The author describes the design and operation of a new stand developed in the workshop of "Sel'khoztekhnik" in the Kaliningrad oblast. This stand allows the mechanization of almost every operation in mounting or dismounting a tractor carriage. Orig. art. has: 3 figures, 3 diagrams and 1 chart.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: 00

NO REF SOV: 000

OTHER: 000

Card 1/1

KUDRYAVTSEV, Valer Radionovich; TOCHELOVICH, N.P., spets. red.; SAZIKOV, M.I., red

[Repairing the NSh gear pumps] Remont shasterenchatykh nasosov  
NSh. Moskva, Biuro tekhn. informatsii, 1963. 54 p.

(MIRA 1825)

MIKITENKO, Kondrat Demidovich [Mykytenko, K.D.]; TOCHENIY, P.A..  
red.; LIMANOVA, M.I., tekhn.red.

[Development of our collective farm during the seven-year  
plan] Kolhosp u semyrichtsi. Kharkiv, Kharkivs'ke knyzhkove  
vyd-vo, 1959. 24 p. (MIRA 13:4)

1. Golova kolgospu imeni 17 partz'izdu Bogodukhivs'kogo rayonu  
(for Mikitenko).  
(Collective farms)

TOCHENOV, O.V.; GRACHEV, B.M.

Semiautomatic assembling machine. Biul. tekhn.-ekon. inform.  
Gos. nauch.-issl. inst. nauch. i tekhn. inform. 17 no.4:22-24  
Ap '64. (MIRA 17:6)

SEROSHATAN, N.A.; TOCHENYY, P.A., red.; LIMANOVA, M.I., tekhn.red.

[Applying the law of value in collective farm production]  
Ispol'zovanie zakona stoimosti v kolkhoznom proizvodstve.  
Khar'kov, Khar'kovskoe knizhnoe izd-vo, 1959. 74 p. (MIRA 13:1)  
(Collective farms)

KONOVALOV, Ivan Antonovich; PUTS, Mikhail Ivanovich; KAPLUNOVSKIY,  
Yevgeniy Petrovich [Kaplunovs'kyi, IE.P.]; TOCHENIY, P.A.  
[Tochenyi, P.A.], red.; LIMANOVA, M.I. [Lymanova, M.I.],  
tekhn. red.

[Give constant attention to the collective farm economy]  
Povsiakdenno vnykaty v ekonomiku. Kharkiv, Kharkivs'ke  
knizhkovе vyd-vo. 1962. 41 p. (MIRA 16:6)

(Collective farms)



*TOCHENNY N.S.*  
POGORELOVA, T.I.; GRACHENVA, A.L.; MASHTAKOVA, P.A.; TIMOSHENKO, A.P.;  
YAKOVILEVA, G.A.; SHUBAYEVA, S.M.; SERGBYEV, Ye.V.; LACHUGINA,  
V.A.; KOMSOMOL'TSEVA, L.I., red.; TOCHENYY, N.S., red.;  
GIL'DEBRANT, Ye., tekhn. red.

[Economy of Krasnoyarsk Territory; a statistical manual] Narodnoe  
khoziaistvo Krasnoyarskogo kraia; statisticheskii sbornik.  
Krasnoyarsk, 1958. 332 p. (MIRA 11:10)

1. Krasnoyarsk (Kray). Statisticheskoye upravleniye. 2. Nachal'nik  
Statisticheskogo upravleniya Krasnoyarskogo kraya (for Tochenyy).  
(Krasnoyarsk Territory--Statistics)

BEREZHNYY, Georgiy Kirillovich [Berezhnyi, H.K.], agitator; TOCHENYY,  
P.A. [Tochenyi, P.A.], red.; LIMANOVA, M.I., tekhn. red.

[In close contact with life] U tishnomu zv'iazku z zhyttiam.  
Kharkiv, Kharkivs'ke knizhkovye vyd-vo, 1961. 14 p.  
(MIRA 15:1)

1. Aparatostkadochnyy tsekh zavoda "Elektromashina", Khar'kov  
(for Berezhnuy). (Kharkov--Electric machinery industry)

TOCHENY, T. M., CHUDNOVSKAYA, L. I., MAL'KOV, A. A., PODMOIL'NAYA, A. P.

"Hygienic Study of Residential Construction in the Cities of  
Stalinskaya Oblast."

report submitted at the 13th All-Union Congress of Hygienists, Epidemiologists  
and Infectionists, 1959.

IVANOV, K.A., inzhener; TOCHENOV, A.A., inzhener; KUZNETSOV, P.P., master.

Balancing the rotor of a steam turbine. *Energetik* 4 no.7:17 J1 '56.  
(Steam turbines) (MLRA 9:9)

IVANOV, T.; TOCHEVA, V.

Industrial hygiene at a construction of tunnel aqueduct.  
Suvrem. med., Sofia 7 no.4:36-43 1956.

1. Iz Nauchnoizsledovatel'skiiia institut po trudova khigiena  
i profesional. bolesti (Direktor: M. B. Lukanov).  
(CLIMATE,  
microclimate in construcion of tunnel aqueduct (Bul))

TOCAIUC, G.

TOCAIUC, G. The running in of automobile aggregates in repair workshops. p. 217.

Vol. 3, no. 6, June 1956  
REVISTA TRANSPORTURILOR  
TECHNOLOGY  
Bucuresti, Rumania

So: East European Accession, Vol. 7, no. 3, March 1957

TOCHENKO, Nikolai

Checking the length of the arms of locomotive cranks and counter cranks, and the angles enclosed between them. Transp delo 6 no.2:43-44 '54.

1. LWZ "G. Dimitrov."

TOCHENOVA, V.

Need for strict inspection. Pozh.delo 9 no.2:28 F '63. (MIRA 16;3)  
(White Russia--Fire prevention--Inspection)



TOCHENYY, M., kapitan

From achievement to achievement. Voen.vest. 41 no.10:39-45 0  
'61. (MIRA 15:2)

(Tanks (Military science))

TOCHENYY, N.

Consolidating automotive transport organizations in Krasnoyarsk  
Territory. Avt.transp. 35 no.1:7-8 Ja '57. (MLBA 10:3)

1. Nachal'nik Statisticheskogo upravleniya Krasnoyarskogo kraya.  
(Krasnoyarsk Territory--Transportation,  
Automotive)

RYABKO, Kh.G.; SHVARTSMAN, S.Ye.; SHUL'MAN, S.L.; TOCHENYY, P.A., red.;  
UMANETS, V.K., tekhn.red.

[Machine-tool units] Zavod malykh agregatnykh stankov.  
Agregatnye stanki. Khar'kov, Khar'kovskoe obl.izd-vo, 1958.  
39 p. (MIRA 13:1)

(Machine tools)

TOCHENYY, P.P. (Petropavlovsk)

Universal level. Geog. v shkole 25 no.3:53-54 My-Je '62.  
(MIRA 15:7)  
(Level (Tool))

TOCHENYY, Petr Petrovich; PRIKHOD'KO, S., red.

[A simple universal level] Prostaishii universal'nyi  
nivelir. Alma-Ata, "Kazakhstan," 1965. 34 p.  
(MIRA 18:11)

TOCHEVA, L.

TOCHEVA, L. New Scientific fertilization of agricultural plants. p.20.

Vol. 11, no. 10, Oct. 1956

KOOPERATIVNO ZEMEDELIE

AGRICULTURE

Sofia, Bulgaria

SO: East European Accession, Vol. 6, No. 3, March 1957

ZHARENKO, A.Z.; TOCHIDLOVASKAYA, K.I.

[Guide to the Botanical Garden of Odessa University] Putavoditel'  
po Botanicheskomu sadu Odesskogo gosudarstvennogo universiteta im.  
I.I.Mechnikova. Odessa, 1956. 84 p. (MIRA 12:11)

1. Odessa. Universytet.  
(Odessa--Botanical garden)

TOCHIDLOVSKAYA, O.G. [Tochydlovs'ka, O.H.], starshiy nauchnyy rabotnik

Annual and perennial flowers recommended for the city and  
province of Odessa. Na dopom.sil'.hosp.ta vyr. no.5:  
39-42 '58. (MIRA 13:3)

1. Botanicheskiy sad Odesskogo gosuniversiteta.  
(Odessa Province---Flowers)



KOSTERIN, S.I.; POLYAKOV, V.V.; SEMENOV, N.I.; TOCHIGIN, A.A.

Hydraulic resistance of steam-water flows in vertical unheated pipes.  
Inzh.-fiz. zhur. 5 no.7:3-10 J1 '62. (MIRA 15:7)

1. Institut mekhaniki AN SSSR, Moskva.  
(Hydrodynamics)

SEMENOV, N.I.; TOCHIGIN, A.A.

Analytic investigation of a laminar split flow of a two-phase  
mixture in inclined tubes. Inzh.-fiz.zhur. / no.11:29-36 II 1961.  
(MIRA 14:10)

1. Institut mekhaniki AN SSSR, g. Moskva.  
(Laminar flow)

TOCHIGIN, A. A., CAND TECH SCI, "<sup>study</sup> INVESTIGATION OF THE  
TRUE STEAM CONTENTS AND HYDRAULIC RESISTANCES IN THE FLOW  
OF STEAM-AND-WATER MIXTURES IN VERTICAL PIPES." MOSCOW,  
1961. (~~GLAVNI~~ <sup>g</sup> [MAIN SCI RES INST] UNDER THE STATE ECONOMIC  
<sup>Council</sup> ~~SOVIET~~ USSR. POWER ENGINEERING INST IMENI G. M. KRZHIZHA-  
NOVSKIY). (KL-DV, 11-61, 223).

-189-

KOSTERIN, S.I., doktor tekhn.nauk; SEMENOV, N.I., kand.tekhn.nauk; TOCHIGIN,  
A.A., inzh.

Relative speeds of currents of steam and water mixture in unheated  
vertical pipes. Teploenergetika 8 no.1:58-65 Ja '61.

(MIRA 14:4)

1. Energeticheskiy institut AN SSSR.  
(Steam pipes--Fluid dynamics)

86472

117430

S/C96/61/000/001/009/014  
E194/E184

AUTHORS: Kosterin, S.I., Doctor of Technical Sciences,  
Semenov, N.I., Candidate of Technical Sciences, and  
Tochigin, A.A., Engineer

TITLE: The Relative Speeds of Steam-Water Flows in Vertical  
Unheated Tubes

PERIODICAL: Teploenergetika, 1961, No. 1, pp. 58-65

TEXT: The flow of gas-liquid mixtures, including steam-water mixtures is accompanied by relative motion of the two phases. The relative motion occurs because of the different densities and viscosities of the components of the two-phase mixture. Knowledge of the laws of the relative speeds is important in calculations on boilers and atomic reactors. Hitherto circulation calculations in steam boilers have made use of approximate data based on true steam content presented in the form of nomograms. There are as yet no generalised relationships for the true steam content or relative speed. The present tests were made with steam-water flow in vertical tubes of two diameters (17 and 30 mm) on the rig illustrated schematically in Fig.1. This consists of an  
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E194/E184

The Relative Speeds of Steam-Water Flows in Vertical Unheated Tubes  
experimental tube 7.5 m high, a mixer for preparing the steam-water mixture, throttles to measure the rates of flow of steam and water and other auxiliary devices. The experimental procedure is described, and in particular the method of assessing the ratio of gas to liquid by  $\gamma$ -ray irradiation from a tin 113 source is described in considerable detail. In discussing the radiation method formulae are derived for different types of flow including emulsion flow when liquid flows near the tube walls and gas in the centre. Study of the nature of flow was not a main object of the investigation, but arrangements were made for partial visual observation of flow structure so as to select the right method of calculating the gas content of the flow. In all the tests the flow was of either the emulsion or annular types. The tests were made at pressures of 40, 70 and 120 atm., the mixture speeds ranged from 1.6 to 10 m/sec and the steam content by output from 0.20 to 0.99. By definition the relative speed of flow of the components of the mixture can be expressed simply in terms of the true steam content and the steam content by output. Curves of steam content by

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S/096/61/000/001/009/014

E194/E184

# The Relative Speeds of Steam-Water Flows in Vertical Unheated Tubes

output with Froude number constant constructed from the experimental results are plotted in Fig.3 for three pressures. For clarity they have been displaced relative to one another upwards along the y-axis. It will be seen that the curves of steam content by output as function of true steam content increase steadily. The true steam content is usually less than the steam content by output which means that the steam has a positive speed relative to water for all mixture conditions considered. The graphs are approximately rectilinear for steam contents by output below 0.5 and above this they are curved, the curvature being greater for low Froude numbers of mixture and pressure. An explanation of this curvature is given in terms of flow structure. As the Froude number and the pressure increase the curves run together until the true steam content is the same as the steam content by output. Fig.4 compares curves of steam content by output as function of true steam content for tubes of 30 and 17 mm diameter with constant Froude number. It will be seen that there is satisfactory coincidence of the true steam content in the tubes

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The Relative Speeds of Steam-Water Flows in Vertical Unheated Tubes if flow takes place with equal Froude numbers. Consequently, the influence of tube diameter on the true steam content is satisfactorily expressed in terms of the Froude number of the mixture. The results are briefly compared with previously published work; agreement is generally good and the reasons for certain differences are discussed. The graphs of steam content by output were used to calculate the speed of the steam relative to the water and the corresponding curves for three pressures are plotted in Fig.5. The speed of the steam is always greater than that of the liquid however low the steam content. The relative speed of the steam increases with an increase in the steam content and in some cases reaches a maximum before diminishing slightly at very high steam contents. It is concluded that the true steam content depends on three main criteria; the steam content by flow, the referred flow, and the Froude criterion. There are 5 figures, 1 table and 2 references: 1 Soviet and 1 English.

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E194/E184

The Relative Speeds of Steam-Water Flows in Vertical Unheated  
Tubes

ASSOCIATION: Energeticheskiy institut AN SSSR  
(Power Engineering Institute AS USSR)

Card 5/5

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11.7430

28905  
S/170/61/004/011/003/020  
B104/B112

AUTHORS: Semenov, N. I., Tochigin, A. A.

TITLE: Analytical investigation of a laminar flow of a biphasic mixture in inclined tubes

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, v. 4, no. 11, 1961, 29-36

TEXT: The authors derive exact solutions of the hydrodynamic equations of a laminar flow of a biphasic mixture in inclined and horizontal tubes. The equation of continuity and the kinetic equation are given without consideration of the vector components perpendicular to the flow direction. The authors derive the following expressions for the velocities of gaseous and liquid phases:

$$w_2(z, \theta) = -\frac{a^2}{2\mu_2} \frac{\partial p_r}{\partial z} \left[ \frac{\cos \theta - \operatorname{ctg} \theta_2 \sin \theta}{\operatorname{ch} z + \cos \theta} + \right. \\ \left. + 4 \int_0^\pi \frac{[1 - \mu(1 - J)] m \operatorname{ch} m \theta_1 - \mu J \operatorname{ctg} \theta_2 \operatorname{sh} m \theta_1}{\operatorname{sh} m \pi [(1 + \mu) \operatorname{sh} m \pi - (1 - \mu) \operatorname{sh} m (\pi - 2 \theta_2)]} \times \right] \quad (11) \text{ and}$$

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Analytical investigation of ...

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B104/B112

$$\begin{aligned}
 & \times \operatorname{sh} m(\theta - \theta_2) \cos m\varepsilon dm \Big]. \\
 w_1(\varepsilon, \theta) = & -\frac{a^2(1-J)}{2\mu_1} \frac{\partial p_r}{\partial z} \left[ \frac{\cos \theta - \operatorname{ctg} \theta_2 \sin \theta}{\operatorname{ch} \varepsilon + \cos \theta} + \right. \\
 & + \frac{4}{1-J} \int_0^\pi \frac{[1 - \mu(1-J)] m \operatorname{ch} m \theta_2 - J \operatorname{ctg} \theta_2 \operatorname{sh} m \theta_2}{\operatorname{sh} m \pi [(1 + \mu) \operatorname{sh} m \pi - (1 - \mu) \operatorname{sh} m(\pi - 2\theta_2)]} \times \\
 & \left. \times \operatorname{sh} m(\theta - \theta_2) \cos m\varepsilon dm \right]. \quad (12).
 \end{aligned}$$

$\theta$  and  $\varepsilon$  are the bipolar coordinates of the problem,  $\gamma = \gamma_2/\gamma_1$ ,  $\gamma_2$  and  $\gamma_1$  are the specific weights of liquid and gas,  $\mu = \mu_2/\mu_1$ ,  $\mu_2$  and  $\mu_1$  are the viscosities of gaseous and liquid phases. If  $\gamma = \mu = 1$ ,  $J = 0$  (homogeneous flow),

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Analytical investigation of ...

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S/170/61/004/011/003/020  
B104/B112

$$w_2(\varepsilon, \theta) = -\frac{R^2}{2\mu_2} \frac{\partial p_r}{\partial z} \left\{ \frac{\cos \theta}{\operatorname{ch} \varepsilon + \cos \theta} + \right. \\ \left. + \frac{4[1 - \frac{\mu_2}{\mu_1}(1-J)]}{1 + \mu_2} \left[ \frac{\theta(1 - \operatorname{ch} 2\varepsilon \cos 2\theta) + \varepsilon \operatorname{sh} 2\varepsilon \sin 2\theta}{\pi(\operatorname{ch} 2\varepsilon - \cos 2\theta)^2} - \right. \right. \\ \left. \left. - \frac{\sin 2\theta}{2\pi(\operatorname{ch} 2\varepsilon - \cos 2\theta)} - \frac{1}{4} \frac{1 + \operatorname{ch} \varepsilon \cos \theta}{(\operatorname{ch} \varepsilon + \cos \theta)^2} \right] \right\} \quad (13) \text{ and}$$

$$w_1(\varepsilon, \theta) = -\frac{R^2}{2\mu_1} \frac{\partial p_r}{\partial z} (1-J) \left\{ \frac{\cos \theta}{\operatorname{ch} \varepsilon + \cos \theta} + \right. \\ \left. + \frac{4[1 - \frac{\mu_2}{\mu_1}(1-J)]}{(1 + \mu_2)(1-J)} \left[ \frac{\theta(1 - \operatorname{ch} 2\varepsilon \cos 2\theta) + \varepsilon \operatorname{sh} 2\varepsilon \sin 2\theta}{\pi(\operatorname{ch} 2\varepsilon - \cos 2\theta)^2} - \right. \right. \\ \left. \left. - \frac{\sin 2\theta}{2\pi(\operatorname{ch} 2\varepsilon - \cos 2\theta)} + \frac{1}{4} \frac{1 + \operatorname{ch} \varepsilon \cos \theta}{(\operatorname{ch} \varepsilon + \cos \theta)^2} \right] \right\} \quad (14)$$

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Analytical investigation of ...

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will be the solutions of the problem. Using the formulas (11)-(14), velocity fields and profiles of laminar flows of a gas-liquid mixture are constructed (Fig. 2).  $\psi$  as a function of  $\beta$  (Fig. 3) and  $\psi$  as a function of  $\gamma$  (Fig. 4) are studied.  $\beta$  and  $\gamma$  are real specific gas content and the gas content of the flow,  $\psi$  is the reduced hydrodynamic resistance:  $\psi = \lambda_{\text{mixt}}/\lambda(\text{Re})$ , where  $\lambda(\text{Re})$  is the hydrodynamic resistance of a single phase flow. It is shown that  $\psi$  depends on  $\beta$ ,  $\mu^0$ , and  $\gamma^0$  in horizontal tubes only. In inclined tubes  $\psi$  depends also on  $J$ , but  $\psi$  does not depend on  $\text{Re}_{\text{mixt}}$ . There are 4 figures and 2 Soviet references.

ASSOCIATION: Institut mekhaniki AN SSSR, g. Moskva (Institute of Mechanics, Moscow)

SUBMITTED: January 23, 1961

Fig. 2. Velocity fields and profiles.

Legend: (a)  $\mu = 0.01$ ; (b)  $\mu = 0.21$ . The figures denote the velocity expressed in units of maximum velocity.

Card 4/7

SEMENOV, N.I.; TOCHIGIN, A.A.

True steam content of steam-water flows in vertical unheated pipes.  
Inzh.fiz.zhur. 4 no.7:30-34 J1 '61. (MIRA 14:8)

1. Energeticheskiy institut imeni G.M.Krzhizhanovskogo, Moskva.  
(Steam flow)

TOCHILIN, A.V., inzh.

Improving technological processes. Bezop.truda v prom. 3  
no.4:28 Ap '59. (MIRA 12:6)

1. Groznenskiy neftepererabatyvayushchiy zavod.  
(Petroleum industry--Management)

TOCHILIN, D.D., inzhener.

Improving the automatic control of field extinguishers. Elek.  
sta. 25 no.6:58 Je '54. (MYRA 7:7)  
(Electric machinery)



TOCHILIN, M. S.

20568 TOCHILIN, M. S. O plikativnykh mikrudislokatsiyakh v magnetitovykh kvartsitakh proterozoya rayona kurskoy magnitnoy anomalii. Uchen. zapiski (Mosk. gos. un-t im. Lomonosava), vyp. 136, geologiya. t. 111, 1949, s. 110-35.-Bibliogr: 16 NAZV.

SO: LETOPIS ZHURNAL STATEY - Vol. 28, Moskva - 1949

TOCHILIN, M. S.

PA 26/49T54

USSR/Geological Prospecting  
Iron Ore

Jan 49

"The Sinking Extraction of Redeposited Ores in  
the Lipetskiy Layer," M. S. Tochilin, Voronezh  
State U, 3 pp

"Dok Ak Nauk SSSR" Vol LXIV, No 1

On the basis of studying stratification of  
Lipetskiy limonites along nine shafts in  
various mines for 1½ years concludes that there  
is a widespread sinking process which occurs  
after mining in the Lipetskiy deposit, linked  
also with genetically redeposited ores. Sub-  
mitted 5 Nov 48.

26/49T54

TOCHILIN, M.S.

✓ Relic metasomatic microstructures of limonite ores and  
their geochemical significance. M. S. Tochilin (Veronezh  
Univ.). ~~Mineralog. Sbornik. L'vov. Gos. Universitet 4,~~ SP  
155-62(1950).—Relic microstructures (rhombohedral hy-  
drogombite grains) observed during study of more than 400  
samples of limonite ore are attributed to primary sedimen-  
tary siderite. Marie Siegrist

CA

8

Existence of turgite. M. S. Tochilin (Voronezh State Univ.). *Doklady Akad. Nauk S.S.S.R.* 81, 75-6 (1951). -- The thermal analysis curves of turgites from the Ural and Lipetsk show characteristic distinctions in the location of the double peaks (endothermic effects). While Rodé (*Zhurnal Khim. i Mekh. Zhel. i Chugun. Stal. i Lit.*, 2 p. 211-21 (1930)) observed distinct effects at 170 to 224° and 330 to 354°, T. gives heating curves with double peaks from 315 and 323° and 350 to 352°. This phenomenon shows that turgite is a mixt. of several Fe oxide hydrates, with variable amts. of goethite, hydrogoethite, and hydrohematite. The characteristic differences of the chem. and phys. properties of turgites from different occurrences are evidently detd. by variable states of recrystn. and dehydration which characterize the deposits. The assumption of Postnjak and Merwin (cf. C.I. 13, 1439) that turgite is a solid soln. of goethite and hematite is abandoned. The microscopic examn. of turgite from Lipetsk also showed a mixt. of goethite and hydrogoethite.

W. Fittel

Tschiling, M. S.

✓ Primary formation of hydrogoethite oolites in siderite-chamosite ores. M. S. Tschiling (State Univ., Voronezh). *Doklady Akad. Nauk S.S.S.R.* 87, 269-71 (1952).—Sedimentary deposits of siderite ores with hydrogoethite, siderite, and chamosite occur on the eastern slope of the Ural, the Kereh peninsula, in western Europe, and Newfoundland. Hydrogoethite is usually a late replacement product of siderite and chamosite. The primary occurrence of hydrogoethite with syngenetic siderite and chamosite, however, is explained by the specific phys.-chem. conditions of a pptn. from marine waters, and their diagenesis. The hydrogoethite oolites are the most abundant constituent in the described ores, forming spheroids or flattened ellipsoids of about 0.5 mm. size. Sometimes the oolites show elastic development, with a healing of the cracks by fine cryst. siderite and chamosite. Both latter minerals form normally the cementing groundmass, of dense, earthy appearance, nearly isotropic, chamosite with  $n =$  about 1.623. Sometimes the hydrogoethite oolites are replaced by chamosite (cf. Krotov, *ibid.* 73, 1263 (1950)) and the concentric-zonal structure is obliterated. Siderite in the fine-cryst. matrix is often more granular and elastic, often changed to chamosite along the cleavage cracks of the crystals. Hydrogoethite is often replaced by siderite which forms bright balls around the oolites in a gray matrix. Siderite oolites, however, are rare. The primary formation of the hydrogoethite oolites from waters of relatively high  $O^{--}$  potentials (cf. Rozhkova, *C.A.* 34, 3213\*) is evident, while the nearly simultaneously formed siderite and chamosite indicate reducing conditions of their pptn. W. Eitel

1. TOCHILIN, M. S.
2. USSR (600)
4. Goethite
7. Primary derivation of oölythie hydrogoethite among siderite-chamosite ores.  
Dokl. AN SSSR, 87, no. 2, 1953.

9. Monthly List of Russian Accessions, Library of Congress, February 1953. Unclassified.

TOCHILIN, M.S.

Geochemistry of authigenic siderites. Vop.min.osad.obr. 3/4:  
203-211 '56. (MLRA 9:11)

1. Gosuniversitet, Voronezh.  
(Siderite)

VISHNYAKOV, S.G., prof., otv. red.; GRISHCHENKO, M.N., prof., red.; DMITRIYEVSKIY, V.S., dots., red.; LAKIONOV, A.K., prof., red.; PLAKSENKO, N.A., dots., red.; TOCHILIN, M.S., prof., red.; PREOBRAZHenskAYA, V.N., dots., red.; KHOZHAKOV, N.P., dots., red.

[Geology and minerals of central Chernozem provinces; transactions] Geologiya i poleznye iskopaemye Tsentral'no-Chernozemnykh oblastei; trudy. Voronezh, Izd-vo Voronezhskogo univ., 1964. 334 p. (MIRA 18:2)

1. Mezhhoblastnoye geologicheskoye soveshchaniye po geologii i mineral'nykh resursam tsentral'nochernozemnykh oblastey, Voronezh, 1962. 2. Voronezhskiy lesotekhnicheskii institut (for Grishchenko). 3. Voronezhskiy gosudarstvennyy universitet (for Preobrazhenskaya).



RUZHITSKIY, V.O.; BYKOV, I.N.; TOCHILIN, M.S.; KURYLEVA, N.A.; MOLOTKOV, S.P.

Ultrabasic ~~explosion~~ breccia of the Russian Platform. Dokl. AN SSSR 162 no.6:  
1367-1369 Je '65. (MIRA 18:7)

1. Voronezhskiy gosudarstvennyy universitet. Submitted March 18, 1965.

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CHERNYSHOV, N.I., dotsent; PETRINA, Z.D., predpodavatel'; LAVRENOVA,  
T.V., assistant; RASKATOV, G.I., dotsent; PREOBRAZHENSKAYA, V.N.,  
dotsent; SHRAMKOVA, G.V., ~~predpodavatel'~~; ~~FLAKSIN, N.A., dotsent;~~  
~~FURMAN, G.I., dotsent~~

Savva Gavrilovich Vishniakov, 1897-1964; obituary. Lit. i pol. iskop.  
no.6:179-180 N-D '64. (MIRA 18:3)

ZAGORODNYI, Vladimir Georgiyevich; MIRSKAYA, Diana Dmitriyevna;  
SUSLOVA, Svetlana Nikolayevna; TOCHILIN, M.S., doktor  
geol.-miner. nauk, otv. red.

[Geology of the Pechonga and volcanic sedimentary series]  
Geologicheskoe stroenie Pechengskoi osadochno-vulkanogen-  
noi serii. Moskva, Izd-vo "Nauka," 1964. 206 p.  
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TOCHILIN, Mitrofan Stepanovich; GORYAINOV, Pavel Mikhaylovich;  
TOKAREV, V.A., doktor geol.-miner. nauk, otv. red.

[Geology and genesis of iron ores in the Imandra region of  
the Kola Peninsula] Geologiya i genezis zheleznykh rud Pri-  
imandrovskogo raiona Kol'skogo poluostrova. Moskva, Izd-vo  
"Nauka," 1964. 101 p. (MIRA 17:4)

PETERSIL'YE, Iosif Abramovich; TOCHILIN, M.S., prof., otv. red.;  
ZHUKOVA, T.P., red.izd-va; VINOGRADOVA, N.F., tekhn.red.

[Geology and geochemistry of natural gases and disseminated  
bitumens of some geological formations in the Kola Peninsula]  
Geologiya i geokhimiya prirodnnykh gazov i dispersnykh bitumov  
nekotorykh geologicheskikh formatsii Kol'skogo poluostrova.  
Moskva, Izd-vo "Nauka," 1964. 169 p. (MIRA 17:4)

IVANOVA, Tat'yana Nikolayevna; TOCHILIN, M.S., doktor geol.-miner.  
nauk, prof., otv. red.; FEDOTOVA, A.I., red.izd-va;  
GUROVA, O.A., tekhn. red.

[Apatite deposits in the Khibiny tundras] Apatitovye mesto-  
rozhdeniia Khibinskikh tundr. Moskva, Gosgeoltekhizdat,  
1963. 286 p. (MIRA 16:7)  
(Khibiny Mountains--Apatite)

TOCHILIN, Mitrofan Stepanovich; TOKAREV, V.A., red.; YASSON, R.A.,  
red. izd-va; BYKOVA, V.V., tekhn. red.

[Origin of ferruginous quartzites] Proiskhozhdenie zhelezi-  
stykh kvartsitov. Moskva, Gosgeoltekhizdat, 1963. 167 p.  
(MIRA 16:5)

(Quartzites)

BEL'KOV, Igor' Vladimirovich; TOCHILIN, M.S., prof., doktor geol.-  
miner. nauk, otv. red.; BUSORGINA, N.I., red.izd-va;  
KONDRAT'YEVA, M.N., tekhn. red.

[Kyanite schists of the Keyvy series; geology, crystalline  
schists, and kyanite ores]Kianitovye slantsy svity keiv; geolo-  
gicheskoe stroenie, kristallicheskie slantsy i kianitovye rudy.  
Moskva, Izd-vo Akad. nauk SSSR, 1963. 319 p. (MIRA 16:3)  
(Kola Peninsula--Kyanite)



BEL'KOV, Igor' Vladimirovich; TOCHILIN, M.S., prof., doktor geol.-  
miner. nauk, otv. red.; BUSORGINA, N.I., red.izd-va;  
KONDRAT'YEVA, M.N., tekhn. red.

[Kyanite schists of the Keyvy series; geology, crystalline  
schists, and kyanite ores]Kianitovye slantsy svity keiv; geolo-  
gicheskoe stroenie, kristallicheskie slantsy i kianitovye rudy.  
Moskva, Izd-vo Akad. nauk SSSR, 1963. 319 p. (MIRA 16:3)  
(Kola Peninsula—Kyanite)

ALEYNIKOV, N.A.; GOLOVANOV, G.A.; USACHOV, P.A.; TOCHILIN, M.S.;  
PTITSYN, Yu.V.

Winning high-iron magnetite-hematite concentrates. Biul.tekh.-  
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'62. (MIRA 15:7)

(Iron—Metallurgy)

TOCHILIN, M.S., otv. red.; BEL'KOV, I.V., red.; GORBUNOV, G.I., red.;  
KOZLOV, Ye.K., red.; SIDORENKO, A.V., red.; TOKAREV, V.A., red.;  
SHENGER, I.A., red. izd-va; KONDRAT'YEV, M.N., tekhn. red.

[Geology of the Kola Peninsula] Voprosy geologii Kol'skogo polu-  
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(MIRA 15:6)

1. Akademiya nauk SSSR. Kol'skiy filial, Kirovsk.  
(Kola Peninsula--Geology)

TOCHILIN, M.S., prof., otv. red.; GRECHKO, V.A., red.

[Flotation of Olenogorsk deposti iron oxides] Flotatsiia  
okislov zheleza Olenegorskogo mestorozhdeniia. Apatity,  
1961. 83 p. (MIRA 15:4)

1. Akademiya nauk SSSR. Kol'skiy filial, Kirovsk.  
(Olenogorsk--Iron oxides) (Flotation)

TOCHILIN, M.S.

Concerning new promising areas and showings of Lipetsk iron ores.  
Trudy VGU 50:13-26 '59. (MIRA 13:12)  
(Lipetsk-Tula region--Iron ores)

SIDORENKO, Aleksandr Vasil'yevich; LUNEVA, Ol'ga Ivanovna; TOCHILIN,  
M.S., prof., otv.red.; BUSORGINA, N.I., red.izd-va; ARONS, R.A.,  
tekhn.red.

[Lithologic study of metamorphic formations] K voprosu o lito-  
logicheskom izuchenii metamorficheskikh tolshch. Moskva, Izd-vo  
Akad.nauk SSSR, 1961. 196 p. (MIRA 14-4)  
(Petrology)

3.9000

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67823

SOV/26-60-1-4/45

AUTHOR: Tochilin, M.S., Professor

TITLE: The Evolution of the Earth's Atmosphere ✓

PERIODICAL: Priroda, 1960, Nr 1, pp 26-32 (USSR)

ABSTRACT: Contending that the evolutionary processes of the Earth's atmosphere have as yet received but scant attention, the author states that he intends to review the problem with the aid of geological and geochemical data. Since the nature of the pre-Cambrian atmosphere has already been established to the satisfaction of most scientists, the article deals with that of the post-Proterozoic period. Under the promptings of Academician N.M. Strakhov, Soviet lithologists have recently been studying the geological aspects of the atmosphere problem and have discovered features which distinguish early sedimentary rock and ore formation processes from those operating in the present age. Soil-waters ✓

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# The Evolution of the Earth's Atmosphere

usually bear ores like manganese and iron in the form of very light bivalent solutions. One of the decisive factors in the formation of these ores in marine basins is the physico-chemical nature of the surface waters and the basins themselves, especially in relation to their acid-alkali and oxydizing-deoxydizing properties. The physical and chemical properties of surface solutions largely depend on atmospheric gas-composition and, under present conditions, usually manifest alkali or high-oxydizing potentials. In these circumstances elements like iron, manganese and aluminum are unable to migrate over large distances. This would explain the non-formation of iron, manganese, phosphorite and oil deposits in the open basins of the present geological age, a fact which argues for the theory that the Earth's atmosphere has been subject to change since the pre-

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The Evolution of the Earth's Atmosphere

Cambrian period. Discussing the effects of structural changes of the Earth's crust on the atmosphere, the author refers to Academician N.S. Shatskiy's geosyncline-platform development graph and touches on the theory that the formation of geosynclines was accompanied by intense volcanic activity during which huge quantities of CO<sub>2</sub>, HCl, HF, SO<sub>2</sub>, NO<sub>2</sub> and other gases were expelled into the atmosphere. As shown by A.B. Ronov and V.Ye. Khain, volcanic deposits amount to 20-24% of middle and upper paleozoic lithological formations, so it appears that, during the mesozoic volcanic cycle, at least 6.5 % of the Earth's surface was covered with basaltic lava. It may therefore be assumed that, in the past, the volcanic factor largely contributed to the formation of the Earth's atmosphere. V.V. Belousov and others have shown that, as the terrestrial crust developed, vol-

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The Evolution of the Earth's Atmosphere

canic water-vapour continually replenished the hydro-sphere.  $\text{CO}_2$  also played an important role in this respect, as can be seen from A.P. Vinogradov's  $\text{CO}_2$

distribution table. Recent research on sedimentation in the Pacific and Atlantic has revealed the immense importance of carbonates in the Earth's crust. The quantity of carbonaceous  $\text{CO}_2$  in the ocean, submarine and land areas exceeded the amount in the atmosphere by more than 100,000 times and the amount in the present-day seas by 5,000 times. The objection that many volcanic gases are formed from air or the melting of magma rocks is refuted on the grounds that these do not alter the geochemical function of volcanic gases on the surface, but are of deep-seated origin. Discussing the fact that many scientists ✓

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disregard the effect of volcanic CO<sub>2</sub> on the atmosphere and credit the control-function of the ocean in the absorption of excess CO<sub>2</sub>, the author quotes Henry's law (water - gas ↔ atmosphere - gas) but contends that, in speaking of crust carbonaceous CO<sub>2</sub> distributions thousands of times greater than those existing in the present atmosphere and hydrosphere, it must be remembered that formerly the atmosphere had a constantly high CO<sub>2</sub> content or replenished it-

self periodically. If, however, atmospheric CO<sub>2</sub> emerged from conditions of relative stability, any surplus would have been absorbed by photosynthesizing vegetation, in which case coal and carbonaceous schist would preponderate over carbonates. On the other hand, volcanic CO<sub>2</sub> would not be immediately absorbed by the ocean but would first fall into inland waters, saturate them with bicarbonates

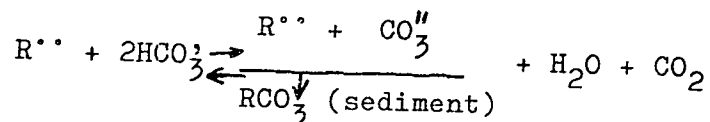
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and, in accordance with the equilibria:



could recombine with the atmosphere and continue the cycle. Volcanic gases like HCl, Cl<sub>2</sub>, HF, SO<sub>2</sub> and NO<sub>2</sub> also have a considerable influence on pH and Eh in surface waters. Recent investigations by I.I. Kurenkov revealed that eruptions of Klyuchevskaya volcano are accompanied by a large increase in the acidity of the waters in the Kamchatka river-basin. Extracts from the volcano also show high acidity. According to B. Mezon, pH activity can fall to zero in volcanic regions. In this respect, the greatest role is played by the halloid elements and their combination with hydrogen and sulfur gases. These elements are abundant in sea water. According to V.Rubi, there are "sur-

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The Evolution of the Earth's Atmosphere

pluses" of  $3 \times 10^{16}$  tons of chlorine and  $2.2 \times 10^{15}$  tons of sulfur in the seas at present. They are deemed to have originated from the effect of volcanic activity on the atmosphere. Academician A.P.

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Vinogradov considers that a large quantity of sea water anions also have a volcanic source. Asserting that these arguments are sufficient to prove the post-proterozoic evolution of the atmosphere, the author continues with a brief biogenic history of oxygen. A.P. Vinogradov puts the annual photosynthetic oxygen production at  $1.5 \times 10^{15}$  tons, sufficient to compensate for loss by oxidizing reaction. Discussing the connection between volcanic products and oxygen, the author concludes that, in past ages, the oxidizing potential on the Earth's surface was much lower than at present and, to qualify his argument, refers to oxidized compounds of iron and manganese with a variable valency and si-

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# The Evolution of the Earth's Atmosphere

derite deposits independent of coal (eg. the Jurassic deposits in Northern Caucasus, Komi ASSR and the Kirovskaya, Gor'kovskaya, Tul'skaya, Orlovskaya, Kurskaya, Lipetskaya and Voronezhskaya oblast's). The primary sedimentation of Jurassic siderites in Northern Caucasus was suggested by A.A. Korzhenevskiy, who concluded that the Jurassic period was characterized by the high CO<sub>2</sub> content of its atmosphere. Academician N.M. Strakhov and Professor G.I. Teodorovich also attribute dolomite formations to a high CO<sub>2</sub> content. The article concludes with a brief discussion of the influence of the atmosphere on the organic world in which the author quotes the works of V.P. Lyubimenko, V.Rubi, and Academicians A.N. Bakh, A.I. Oparin, V.I. Paladin and A.N. Severtsov to support his contention that the atmosphere has a lower CO<sub>2</sub> content than in former geological ages. As final

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The Evolution of the Earth's Atmosphere

proof of atmospheric evolution the author cites such events as the dying-out of a species and climatic change. There are 2 tables and 17 Soviet references.

ASSOCIATION: Kol'skiy filial Akademii nauk SSSR/Kirovsk (The Kola  
Branch of the AS USSR/Kirovsk)                      ✓

Card 9/9

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 1,  
p 69 (USSR) 15-57-1-441

AUTHOR: Tochilin, M. S.

TITLE: The Geochemistry of Authigenic Siderite (K geokhimi  
autigennykh sideritov)

PERIODICAL: Vopr. mineralogii osadoch. obrazovaniy. Books 3-4,  
L'vov, L'vovsk. un-t, 1956, pp 203-211.

ABSTRACT: Large accumulations of authigenic siderite are known  
in the Precambrian iron-ore formations of all the  
continents on the earth. Siderite alternates in  
layers with quartz, chalcedony, magnesian iron sili-  
cates, and aluminosilicates. The views concerning  
the origin of authigenic siderite are discussed. 1) The  
mineral is formed by chemical precipitation in water  
from a saturated solution of bicarbonate of ferrous  
oxide, with the partial pressures of CO<sub>2</sub> and O corre-  
sponding to the earth's atmosphere. The author believes  
that iron hydroxide accumulated in the Precambrian

Card 1/2



GORSEKOV, G.P., prof.; TOCHILIN, M.S., dotsent

Plicated microdislocations in Proterozoic magnetite quartz of the  
Kursk Magnetic Anomaly. Uch. zap. Mosk. un. no.136:110-136 '49.  
(MIRA 11:10)

(Kursk Magnetic Anomaly--Quartz)

TOCHILIN, S.; AVERKIN, A.; FRENKEL', A.

At the March exhibitions and fairs. Vnesh. torg. 41 no. 3:24-26  
'61. (MIRA 14:2)

(Leipzig--Germany--Exhibitions)

(Utrecht, Netherlands--Exhibitions)

(Cairo--Agriculture--Exhibitions)

TOCHILIN, V.I.

On aberrant goiter. Probl. endkok. i gorm. 6 no. 1:114-115 Ja-F '60.  
(MIRA 14:1)

(THYROID GLAND—ABNORMITIES AND DEFORMITIES)

SMIRNOV, A.I.; SMIRNOVA, Z.S.; SHAMANAYEV, I.P.; TOCHILIN, V.Ye., otv.  
red.; STRUKOV, A.N., red. [deceased]; MARKOCH, K.G., tekhn. red.

[Manual for the sorting and classifying of international mail  
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